Redescription of *Eptatretus luzonicus* Fernholm et al., 2013, a Replacement Name for *Eptatretus fernholmi* McMillan and Wisner, 2004 (Craniata: Myxinidae), Based on the Discovery of the Holotype and Additional Specimens from the Philippines

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The holotype of the hagfish *Eptatretus luzonicus* (= *Eptatretus fernholmi*) (Myxinidae), lost prior to its description, was found and is redescribed along with five additional specimens trapped at 578–710 m depth between Luzon and Mindoro islands during the 2011 California Academy of Sciences Hearst Philippine Expedition. In addition, a single specimen of *Myxine* cf. *formosana*, previously known from Taiwan, was also trapped at the same location, between 587 and 604 m depth.

KEYWORDS: Myxinidae; *Eptatretus luzonicus*; *Eptatretus fernholmi*; redescription; taxonomic history; Philippines.

On 16 October 1907, the U.S. Fish Commission Steamer *Albatross* left San Francisco on her way to Manila for the longest and most extensive expedition of the ship's career. It took about 2.5 years before the *Albatross* crossed the Golden Gate again, bringing in her holds thousands of fishes and invertebrates that were later deposited in the U.S. National Museum, Smithsonian Institution. The number of fishes collected during the *Albatross* Philippine Expedition is difficult to calculate but it was estimated at about 100,000 specimens (Smith and Williams 1999), including a single hagfish specimen. This specimen remained unnamed for many years until it was described as *Eptatretus fernholmi* McMillan and Wisner, 2004, a name recently replaced by *Eptatretus luzonicus* Fernholm, Norén, Kullander, Quattrini, Zintzen, Roberts, Mok, and Kuo, 2013.

Nearly a century later, the California Academy of Sciences Hearst Expedition to the Philippines included a voyage aboard the M/V *DA-BFAR* in the vicinity of the Verde Island Passage and the Calavite Passage (between Luzon and Mindoro islands). Although the deepwater marine portion of the Hearst Expedition was limited in duration and coverage, it was able to capture, photograph, and study numerous fishes and invertebrates that were poorly known or new to science. From 28 May to 4 June 2011, a total of 29 bottom trawl stations were made between 82 and 2217 m and eight trap stations were set from 60–841 m depth. Six specimens of hagfishes were trapped: a single specimen tentatively identified as *Myxine formosana* Mok and Kuo, 2001, previously reported from Taiwanese waters, and five additional specimens of *Eptatretus luzonicus*, previously known only from the damaged and lost holotype collected from the Philippines. The discovery of the holotype and additional material of *E. luzonicus* deserve special discussion and that is the purpose of this paper.

Materials and Methods

Measurements and counts (Table 1) and the names for anatomical structures follow Fernholm and Hubbs (1981), McMillan and Wisner (1984), Wisner and McMillan (1995), and Mok (2001).

Length of the specimens (in mm) is given as total length (TL), the distance from the front of the rostrum to the end of the caudal finfold. All other measurements are given as percentage of TL (Table 1). About 7–11% shrinkage was noted in the TL of four specimens that were measured before preservation. Some shrinkage occurs in all myxinid specimens upon preservation, mainly in the trunk length (McMillan and Wisner 1984).

Counts of gill pouches and cusps were taken from both sides, whereas slime pore counts are from the left side. Details on the deepwater fishes collected during the Hearst Expedition are provided by Iwamoto and McCosker (2014). Specimens examined are deposited in the fish collections of the California Academy of Sciences (CAS), National Museum of Natural History (USNM), and Núcleo em Ecologia e Desenvolvimento Socioambiental, Universidade Federal do Rio de Janeiro (NPM).

Taxonomic History of *Eptatretus luzonicus* (= *Eptatretus fernholmi*)

Eptatretus luzonicus has a convoluted and curious taxonomic history. The holotype was collected in 1909 during the *Albatross* Expedition to the Philippines and deposited at the USNM fish collection. Like many of the nearly 100,000 specimens collected during the expedition it was apparently shelved and remained unidentified for many decades (*cf.* Smith and Williams 1999). While at the USNM, on June 29, 1972, Carl Leavitt Hubbs of the Scripps Institution of Oceanography (SIO) examined the hagfish specimen collected by the *Albatross* Expedition and identified it as *Myxine garmani* Jordan and Snyder, 1901; it was catalogued as USNM 207761 on July 11,1972. It was then sent to Hubbs on loan at SIO and, after further examination, Hubbs thought that it was an undescribed species of *Myxine* but did not open the abdominal cavity to count its gill pouches (which would have allowed the proper generic identification). The specimen remained at SIO and was later examined by Bo Fernholm of the Swedish Museum of Natural History during a six-month collaboration that he spent at SIO with Hubbs. At that time they realized that it was a new species of *Eptatretus* and they gave it the manuscript name "*Eptatretus luzonica*". They recognized that the specimen was in poor condition and were eager to get more and better material for its description. Fernholm went to the Philippines in an effort to get more specimens but he did not succeed, and they never published the new species (Bo Fernholm pers. comm., February 17, 2012).

Subsequently, Charmion McMillan and Robert Wisner worked in the Hubbs lab at SIO and assisted him with his hagfish studies. In 2004 they published a review of the hagfishes from the northwestern Pacific, in which they described three new species, *Eptatretus fernholmi*, *Paramyxine moki*, and *Paramyxine walkeri* (McMillan and Wisner 2004). They briefly described the Philippine specimen collected by the *Albatross* Expedition as *Eptatretus fernholmi* without examination of any specimen. Their description was based on a picture and unpublished notes by Bo Fernholm. They mentioned that Bo Fernholm ". . . planned to describe it as a new species '*E. luzonica*' with Carl L. Hubbs, to whom he gave the data and photo, but apparently abandoned the idea when Hubbs died a few years later. The notes and photo came into our possession with other hagfish data when Hubbs' lab was closed." McMillan and Wisner (2004) also stated that ". . . the specimen was left in the National Museum of Natural History", but the specimen was never returned to the USNM fish collection. In February 2012, in response to a request by Michael Mincarone and Bo Fernholm, Philip Hastings and H. J. Walker were able to locate the specimen (Fig. 1) at SIO.

Recently, Fernholm et al. (2013) performed a phylogenetic analysis of the Myxinidae based on molecular data, which resulted in the synonymization of *Paramyxine* with *Eptatretus*. This created a homonymy of *Paramyxine fernholmi* Kuo, Huang, and Mok, 1994 (from Taiwan) with *Eptatretus fernholmi* McMillan and Wisner, 2004 (from the Philippines). As *Eptatretus fernholmi* became

a junior homonym of *Paramyxine fernholmi*, its name was replaced by *Eptatretus luzonicus* Fernholm, Norén, Kullander, Quattrini, Zintzen, Roberts, Mok, and Kuo, 2013. A similar name, "*Eptatretus luzonica*", was mentioned by McMillan and Wisner (2004) in the original description of *E. fernholmi*, as the name initially intended for the species.

Eptatretus luzonicus Fernholm, Norén, Kullander, Quattrini, Zintzen, Roberts, Mok, and Kuo, 2013

Figures 1–4; Table 1

Eptatretus fernholmi McMillan and Wisner, 2004:53 (former name).

Material examined.— Holotype: USNM 207761, tag 8686, 373 mm TL [now 360 mm], R/V *Albatross*, station D5444: 12°43′51″N, 124°58′50″E, off Atalaya Point, NW of Batag Island, northern Samar, the Philippines, collected by 12 foot Agassiz beam trawl, at 308 fathoms (563 m) depth, green mud bottom, 3 June 1909, 0957–1049 h. Additional material: CAS 233675 (1, 563 mm TL), M/V *DA-BFAR*, station HEPD 023: 13°55′01.1994″N, 120°04′34.2006″E, between Luzon and Mindoro islands, the Philippines, collected by trap, at 316–388 fathoms (578–710 m) depth, sandy-muddy bottom, 1–2 June 2011, 2035–0645 h. CAS 233676–233678 (3, 334–430 mm TL), M/V *DA-BFAR*, station HEPD 013: 13°39′24.0012″N, 120°29′07.1982″E, between Luzon and Mindoro islands, the Philippines, collected by trap, at 321–330 fathoms (587–604 m) depth, muddy bottom, 30–31 May 2011, 2010–0715 h. NPM 1999 (1, 443 mm TL), collected with CAS 233676.

Diagnosis.— *Eptatretus luzonicus* can be distinguished from all known congeners by the following combination of characters: eight pairs of gill pouches; 3-cusp multicusps on the anterior sets and 2-cusp multicusps on the posterior sets of cusps; 47–51 total cusps; 13–15 prebranchial pores; 49–55 trunk pores; 84–88 total pores; a single nasal-sinus papilla in the middorsal surface of the nasal sinus.

Description.— Based on the holotype and five non-type specimens: Body subcylindrical, slightly deeper than wide at prebranchial and branchial regions, laterally compressed at trunk and strongly compressed at tail. Rostrum bluntly rounded. A single nasal-sinus papilla in the middle of the dorsal surface of the nasal sinus (not seen in the holotype). Three pairs of barbels on head, first two pairs about nearly equal in size (1.1–1.5% TL) and adjacent to opening of nasopharyngeal duct; third pair longer (2.0–2.4% TL) and immediately adjacent to oral cavity. Ventral finfold 1–7 mm high, beginning within anterior 22–38% of trunk, extending backward to the cloaca. Caudal finfold thin, its ventral outline nearly straight, beginning immediately posterior to edge of cloaca, extending around tail to dorsal surface, ending nearly over cloaca.

Total length of the six specimens analyzed (including the holotype) range from 334 to 563 mm. Body proportions as a percentage of total length (those of holotype given first, followed by ranges of non-type specimens in parentheses): preocular length 5.8 (5.4–6.3); prebranchial length 21.4 (20.7–22.6); branchial length 8.3 (7.4–7.8); trunk length 55.6 (53.0–55.1); tail length 15.0 (16.0–17.2); body width at prebranchial region 4.7 (4.8–6.7); body depth at mid-trunk including

Figure 1. Holotype of *Eptatretus luzonicus*; USNM 207761, 360 mm TL.

TABLE 1. Proportions and counts for the holotype and non-type specimens of *Eptatretus luzonicus* from the Philippines.

	McMillan and Wisner (2004)	**Present study**					
	Holotype	**Holotype**	**Non-types**				
Collection number	USNM 200761	USNM 207761	CAS 233675	CAS 233676	CAS 233677	CAS 233678	NPM 1999
Tag number			DC-1501	DC-1387	DC-1389	DC-1393	DC-1394
Sex	?	?	Female	?	Female	Female	Female
Total length (mm)	373	360	563	334 (360 fresh)	430 (485 fresh)	404 (453 fresh)	443 (490 fresh)
Measurements in %TL							
Preocular length	—	5.8	6.2	6.3	5.6	6.2	5.4
Prebranchial length	21.2	21.4	21.7	21.3	20.7	21.8	22.6
Preventral length	—	?	48	46.4	49.3	45.8	42
Branchial length	8	8.3	7.8	7.5	7.7	7.4	7.4
Trunk length	53.6	55.6	53.3	55.1	54.7	54.5	53
Tail length	14.9	15	16	16.5	16.7	16.8	17.2
Body width	—	4.7	6.7	4.8	6.3	5.9	5.2
Body depth:							
Including VFF	8	?	10.7	7.5	7.4	7.9	7.1
Excluding VFF	8	?	9.4	6.7	7	7.7	7
Over cloaca	—	6.7	8.2	6.6	6	5.9	6.1
Tail depth	8.6	8.1	9.8	8.4	8.8	8.4	9.7
Barbel length:							
First	—	1.5	1.3	1.3	1.4	1.2	1.1
Second	—	1.5	1.3	1.3	1.4	1.5	1.3
Third	—	2.4	2	2.2	2.4	2.2	2
Counts							
Teeth:							
Multicusp pattern	3/2	3/2	3/2	3/2	3/2	3/2	3/2
Anterior unicusps	11 + 11	11 + 11	10 + 10	10 + 9	10 + 11	9 + 10	10 + 10
Posterior unicusps	9 + 10	10 + 9	9 + 9	9 + 9	9 + 9	9 + 9	10 + 9
Total cusps	51	51	48	47	49	47	49
Pores*:							
Prebranchial	15	15 + 15	13	14	13	14	14
Branchial	7	7 + 8	8	8	7	7	7
Trunk	50	49 + 50	52	53	55	53	49
Cloacal	—	3 + 3	4	4	3	3	3
Tail	9	13 + 13	14	13	13	12	14
Total pores	81	84 + 86	87	88	88	86	84
Gill apertures	8 + 8	8 + 8	9 + 8	8 + 8	8 + 8	8 + 7	8 + PCD
Gill pouches	8 + 8	8 + 8	9 + 8	8 + 8	8 + 8	8 + 7	8 + 8

* Left + right count for the holotype.

ventral finfold (VFF) (holotype not measurable) (7.1–10.7); body depth excluding VFF (holotype not measurable) (6.7–9.4); body depth at cloaca 6.7 (5.9–8.2); tail depth 8.1 (8.4–9.8).

A 3-cusp multicusp on the anterior (outer) sets and a 2-cusp multicusp on the posterior (inner) sets of cusps; 9–11 unicusps on the anterior and 9–10 unicusps on the posterior sets of cusps; total cusps 47–51. Cusps slender and pointed (Fig. 2). A single palatine tooth in the roof of the mouth. A row of slime pores segmentally arranged on each side of body. Slime-pore counts (left + right sides of holotype, followed by ranges for non-type specimens in parentheses): prebranchial pores 15 + 15 (13–14); branchial pores 7 + 8 (7–8); trunk pores 49 + 50 (49–55); tail pores 13 + 13 (12–14); total pores 84 + 86 (84–88).

FIGURE 2. Dentition (anterior and posterior left series and palatine tooth) of *Eptatretus luzonicus*; CAS 233675, 563 mm TL. Scale = 2 mm.

Eight pairs of gill pouches and gill apertures in the holotype and most non-type specimens; one specimen with 7 gill pouches and apertures on the right side and another specimen with 9 gill pouches and apertures on the left side of the body. One specimen with 8 gill apertures plus the pharyngocutaneous duct (PCD) aperture on the left side. Each gill pouch connected to its own gill aperture by the efferent branchial duct. Last branchial duct usually confluent with PCD, forming a large aperture on the left side of the body. Posterior tip of dental muscle reaches the fourth or fifth pair of gill pouches. Ventral aorta branches at the level of eighth gill pouch; all afferent branchial arteries connected to the branched portion of ventral aorta on both sides.

Body color (Fig. 3) dark chocolate brown; tip of barbels whitish; conspicuous white eyespots; mouth and gill apertures with whitish margins; ventral finfold and caudal finfold the same color as body. Body color slightly lighter in preserved specimens.

DISTRIBUTION.— Known only from the Philippines (Fig. 4). The holotype was collected at

FIGURE 3. Fresh specimen of *Eptatretus luzonicus*; NPM 1999, 490 mm TL (443 mm after preservation).

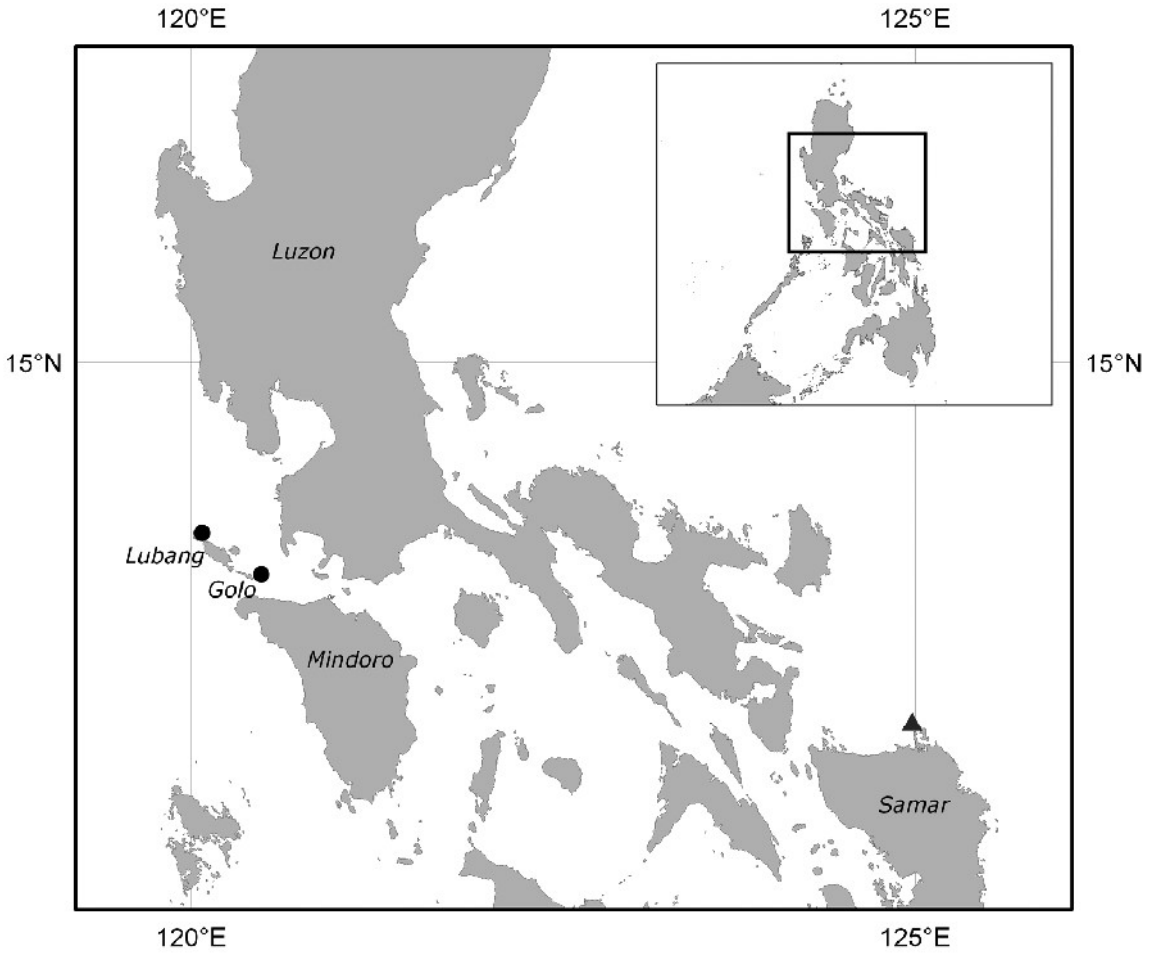

FIGURE 4. Collection sites of the holotype (triangle) and additional specimens (circles) of *Eptatretus luzonicus* in the Philippines.

12°43′51″N, 124°58′50″E, off northern Batag Island (north of Samar). The recent material from Hearst Expedition was collected from two different stations in the western part of Verde Island Passage: one off northern Lubang Island and another off eastern Golo Island. It is likely that *E. luzonicus* has a wider distribution in the Philippines.

HABITAT.— According to a report of the U.S. Bureau of Fisheries, the *Albatross* station D5444, where the holotype of *E. luzonicus* was trawled, was at 308 fathoms (563 m) depth, on a green mud bottom with a bottom temperature of 44.3°F (6.8°C). The surface water temperature was 83°F (28.3°C) (Anonymous 1910). The additional material from the Verde Island Passage was collected at depths between 578 and 710 m. Sediment type ranged from mud to sand.

DISCUSSION

The holotype has completely lost its skin, making accurate measurements of the tail length and tail depth, and measurements taken from the ventral finfold impossible (those measurements in Table 1 are approximations). The first two barbels on the left side are shorter than those on the right and appear to have been previously dried. There are deep dissections along the ventral part of the prebranchial and branchial regions and along both sides of the trunk region. Some internal organs are missing, although it is still possible to observe the dental muscle, gill pouches, heart, parts of

the ventral aorta, and parts of the intestine, which has been dissected along its entire length. The third gill pouch on the left side is missing and the gonads cannot be found. The liver and several unidentified small pieces of muscle tissue are detached from the body. Fortunately, the teeth are in good condition making an accurate tooth count possible. The slime pores can be easily counted, except those of the trunk, which are difficult to observe due to dissections and poor preservation. We are unable to say with certainty whether the poor condition of the specimen resulted from inappropriate preservation and/or multiple dissections after collection. All material collected by the *Albatross* Philippine Expedition was preserved directly in ethyl alcohol as formalin was not used at that time (Smith and Williams 1999).

In their original description of *Eptatretus fernholmi*, McMillan and Wisner (2004) briefly compared this species with some western Pacific hagfishes, including *Eptatretus strahani* McMillan and Wisner, 1984 (Philippines), *Eptatretus chinensis* Kuo and Mok, 1994 (South China Sea), and *Eptatretus okinoseanus* (Dean, 1904) (Japan and Taiwan). McMillan and Wisner (2004) stated that *Eptatretus fernholmi* had no eyespots and a vestigial ventral finfold, and therefore differed from *E. okinoseanus*, which has prominent eyespots and a well-developed ventral finfold. This statement was based on Bo Fernholm's notes taken from the holotype, which was already in poor condition when he examined it in 1976 (Bo Fernholm pers. comm., February 17, 2012). The badly damaged skin of the holotype makes it impossible to check its eyespot and ventral finfold conditions. The examination of additional specimens, however, revealed that *E. fernholmi* (= *E. luzonicus*) has very conspicuous eyespots (Fig. 3) and a ventral finfold that ranges from 1 mm (in a 404-mm specimen) to 7 mm high (in a 563-mm specimen). Therefore, *E. luzonicus* cannot be distinguished from *E. okinoseanus* based on the diagnosis proposed by McMillan and Wisner (2004).

The presence of eight pairs of gill pouches and 3-cusp multicusps on the anterior sets and 2-cusp multicusps on the posterior sets of cusps distinguishes *Eptatretus luzonicus* from all congeners except five: *Eptatretus gomoni* Mincarone and Fernholm, 2010 from Western Australia, *Eptatretus indrambaryai* Wongratana, 1983 from Thailand, *Eptatretus octatrema* (Barnard, 1923) from South Africa, *Eptatretus okinoseanus* (Dean, 1904) from Japan and Taiwan, and *Eptatretus wisneri* McMillan, 1999 from the Galápagos Islands. *Eptatretus luzonicus* differs from these five in having: 47–51 total cusps (vs. 40 in *E. octatrema*, 44 in *E. wisneri*); 13–15 prebranchial pores (vs. 23 in *E. octatrema*, 9–10 in *E. wisneri*); 49–55 trunk pores (vs. 57–58 in *E. gomoni*, 65 in *E. octatrema*, 54–61 in *E. okinoseanus*, 43–45 in *E. wisneri*); and 84–88 total pores (vs. 91–93 in *E. gomoni*, 77–82 in *E. indrambaryai*, 109 in *E. octatrema*, 87–97 in *E. okinoseanus*, 73–75 in *E. wisneri*). In addition, *E. luzonicus* has a single nasal-sinus papilla in the middorsal surface of the nasal sinus, while no nasal-sinus papilla was observed in all these eight-gilled congeners. Another *Eptatretus* species, *E. mccoskeri* McMillan, 1999 from the Galápagos Islands also has eight pairs of gill pouches, but it differs from all other eight-gilled congeners in having 3-cusp multicusps on the anterior and posterior sets of cusps and two bilaterally symmetrical nasal-sinus papillae in the dorsal surface of the nasal sinus.

Another species of *Eptatretus* has been recorded from the Philippines. *Eptatretus strahani* McMillan and Wisner, 1984 was originally described from five specimens trapped at 14°00′N, 120°18.2′E (near Lubang Island) at 189 m depth on 21–22 March 1976 (McMillan and Wisner 1984). It has also been recently reported off Western Australia, based on two specimens collected at two locations: 16°54′S, 120°22′E, at 405 m, and 17°32′S, 118°48′E, at 430 m (Mincarone and Fernholm 2010). *Eptatretus luzonicus* can be easily distinguished from *E. strahani* by its number of gill pouches (8 vs. 7) and its multicusp pattern (3/2 vs. 3/3).

Also collected during the Hearst Expedition to the Philippines was a single specimen (CAS 233680, 393 mm TL) of the genus *Myxine*, which was trapped at 587–604 m in the same station

(HEPD 013) as *E. luzonicus*. This specimen has been tentatively identified as *Myxine formosana* Mok and Kuo, 2001, a species known only from off southwestern Taiwan (Mok and Kuo 2001). Despite some differences in color pattern, all measurements and counts are similar to those described for *M. formosana*. The collection of additional specimens around the Philippines would be helpful to confirm the identity of this species.

Currently, only three species of hagfish are known from Philippine waters, *Eptatretus luzonicus*, *E. strahani*, and *Myxine* cf. *formosana*. Additional deep-water sampling using trawls and baited traps will likely provide new information on the species composition and distribution of Philippine hagfishes.

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Comparative Material Examined

***Eptatretus gomoni*:** 2 specimens. Western Australia: WAM 31292-003, holotype, 790 mm, west of Shark Bay-Exmouth (no coordinates given), 260 m, trap, L. Hand, 15 May 1997; NMV A.29719-004, paratype, 1(370 mm), off Cape Leveque, 14°36′53″S; 121°19′39″E to 14°36′15″S; 121°20′44″E, 698–705 m, RV *Southern Surveyor*, beam trawl, D. J. Bray, 13 May 2007.

***Eptatretus indrambaryai*:** 2 specimens. Thailand: AMS I.23661001, paratype, 1(188 mm), and BMNH 1983.3.24.1, paratype, 1(175 mm), Eastern Indian Ocean, Andaman Sea, 07°37′02″N, 97°52′00″E, 267–400 m, RV *Nagasaki Maru*, deep sea shrimp trap, T. Wongratana, 9–10 Nov. 1981, 19:00–06:30 h.

***Eptatretus mccoskeri*:** 3 specimens. Galápagos Islands (Ecuador): CAS 86431, holotype, 310 mm, Pacific, Ecuador, Galápagos Islands, San Cristobal Island, 01°06′19″S, 89°06′56″W, 660 ft (201 m), RV *Johnson Sea Link*, baited metallic minnow trap, J. E. McCosker, R. G. Gilmore, 6 Nov. 1995; SIO 97–75 (ex CAS 86431), paratype, 1(290 mm), and USNM 344905, (ex CAS 86431), paratype, 1(284 mm), taken with the holotype.

***Eptatretus octatrema*:** 1 specimen. South Africa: BMNH 1927.12.6.1 (ex SAM 13031), syntype, 1(280 mm), Cape Saint Blaize, West 3/4 North, 4 miles, 27 fm (49 m), RV *Pieter Faure*, trawl, 25 Jan. 1900.

***Eptatretus okinoseanus*:** 6 specimens. Japan: BSKU 44343, 1(510 mm), Mimase fish market, Kochi, offshore trawl, 26 Nov. 1987; BSKU 44349, 1(515 mm), Mimase fish market, Kochi, off Okitsu, 28 Nov. 1987; MOVI 37392 (ex BSKU 51886), 1(519 mm), Mimase fish market, Kochi, offshore trawl, 1 Mar. 2000; NSMT-P 65670, 1(324 mm), East China Sea, 31°25.3′N, 128°24.1′E–31°22.1′N, 128°31.1′E, 461–500 m, RV *Yoko-maru*, T. Kubodera, H. Namikawa, 8 Nov. 2002, 06:55–08:29 h; NSMT-P 11000, 1(580 mm), Honshu, Boso Peninsula, off Choshi, trawl, 12 Apr. 1971; SU 23522, 1(402 mm), Misaki, Sagami, K. Aoki (obtained by D. S. Jordan in 1911).

***Eptatretus strahani*:** 5 specimens. Philippines: MNHN 1981–0722, paratype, 1(500 mm), SIO 81–116, paratype, 1(430mm), and USNM 227442, paratype, 1(435 mm), near Lubang Island, 14°00′N, 120°18.2′E, 189 m, RV *Vauban*, trap, 21–22 Mar. 1976. Australia: NMV A.13506, 1(500 mm), Western Australia, west of King Sound, 16°54′S, 120°22′E, 405 m, FV *Striker*, scampi net, S. Morris, 4 Apr. 1989. NTM S.12589-004, 1(620 mm), Western Australia, off Rowley Shoals, northwest shelf, 17°32′S, 118°48′E, 430 m, bottom trawl, W. Houston, 2 Nov. 1985.

***Eptatretus wisneri*:** 2 specimens. Galápagos Islands (Ecuador): CAS 86429, holotype, 355 mm, Fernandina Island, 0°27′56″S, 91°37′33″W, 1848 ft (563 m), RV *Johnson Sea Link*, minnow trap, J. E. McCosker et al., 14 Nov. 1995, 11:56–14:01 h; SIO 97–76 (ex CAS 86430), paratype, 1(316 mm), Fernandina Island, 0°17.5′S, 91°38.9′W, 1680 ft (512 m), RV *Johnson Sea Link*, minnow trap, J. E. McCosker et al., 16 Nov. 1995.

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